Attorney: Walter G. Maxwell
. · · · Docket No.: 51306/WGlM/W277
Inventor(s): N. Bruce Moore et al.
Title: THREE-DIMENSIONAL STEERING TOOL
FOR CONTROLLED DOWNHOLE EXTENDEDREACH DIRECTIONAL DRILLING
Sheet 1 of 15

FLEX SECTION ROTARY SECTION MUD PULSE TELEMETRY SECTION

F1G.1

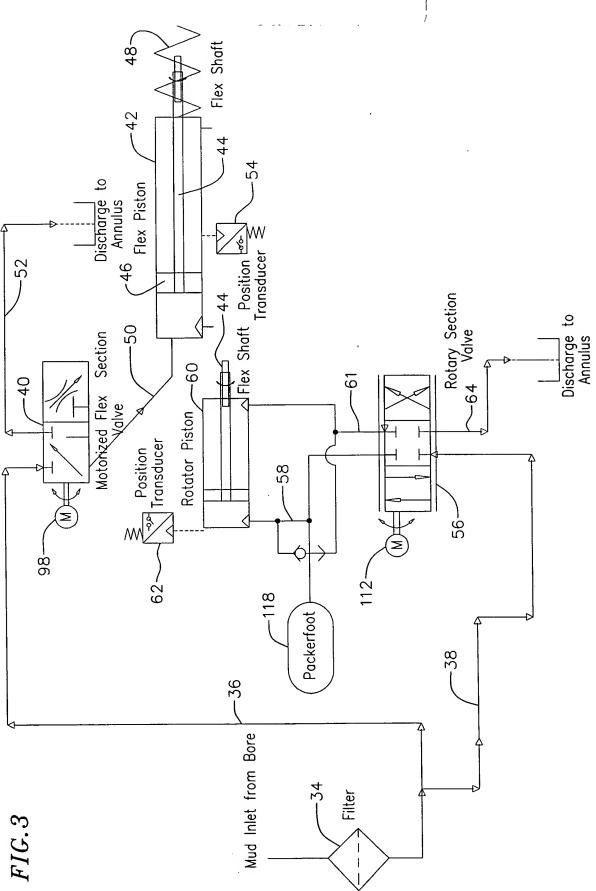


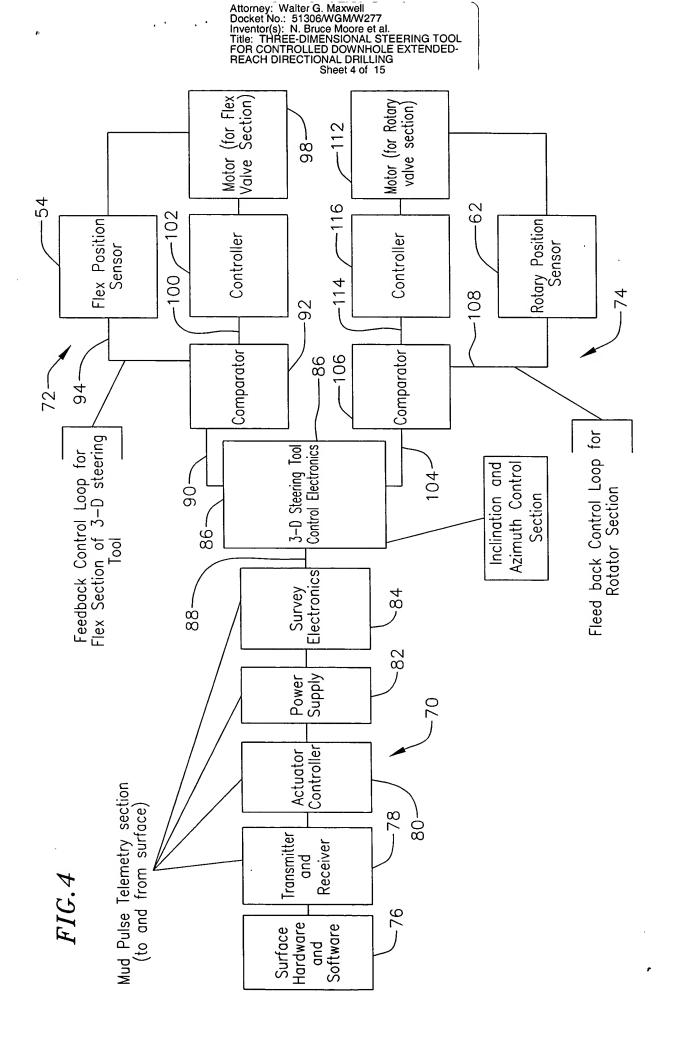
Attorney: Walter G. Maxwell
Docket No.: 51306/WGM/W277
Inventor(s): N. Bruce Moore et al.
Title: THREE-DIMENSIONAL STEERING TOOL
FOR CONTROLLED DOWNHOLE EXTENDEDREACH DIRECTIONAL DRILLING
Sheet 2 of 15

FLEX SECTION ROTARY SECTION , MUD PULSE TELEMETRY SECTION

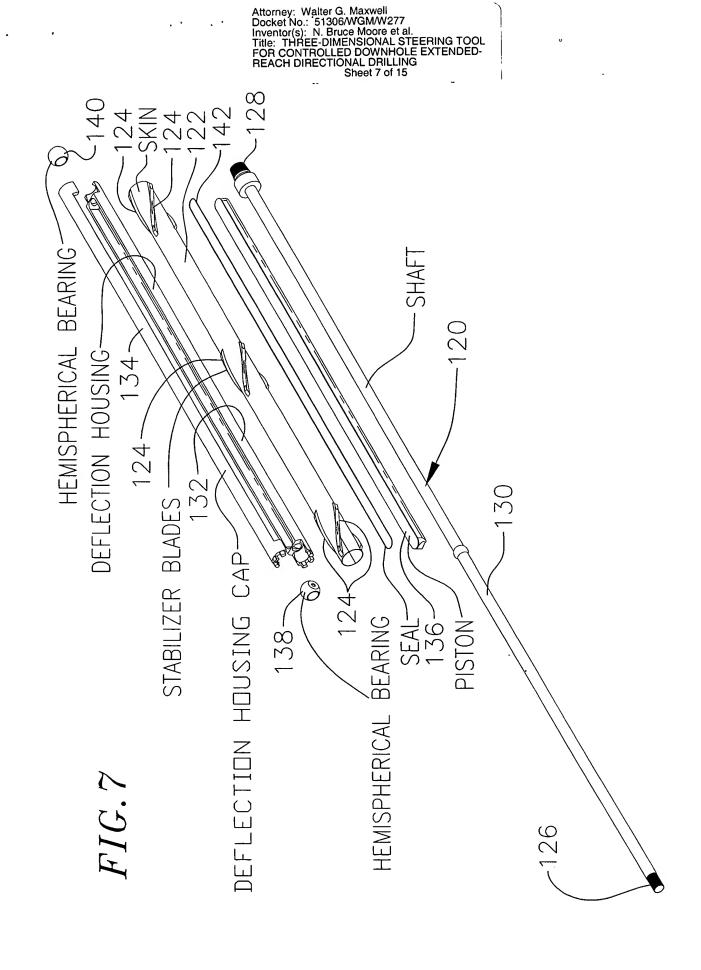
NO.2

Attorney: Walter G. Maxwell
Docket No.: · 51306/WGMW277
Inventor(s): N. Bruce Moore et al.
Title: THREE-DIMENSIONAL STEERING TOOL
FOR CONTROLLED DOWNHOLE EXTENDEDREACH DIRECTIONAL DRILLING
Sheet 3 of 15 Flex Shaft 48 42 54 Discharge to Annulus Flex Piston Position Est 52





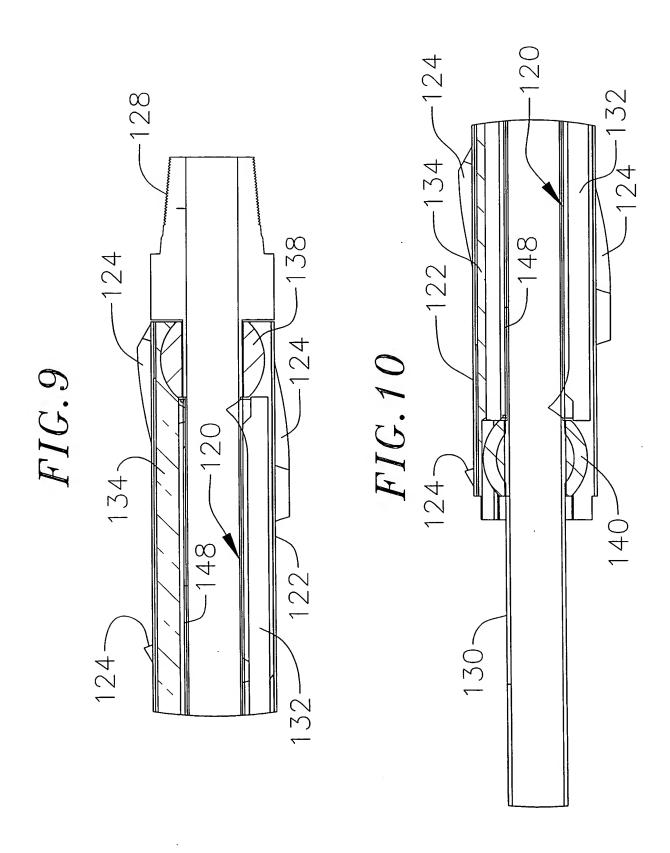
Attorney: Walter G. Maxwell
Docket No.: 51306/WGM/W277
Inventor(s): N. Bruce Moore et al.
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Sheet 5 of 15 STABILIZER BLADES-FIG.5



- 1

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FOR CONTROLLED DOWNHOLE EXTENDEDREACH DIRECTIONAL DRILLING
Sheet 8 of 15 DEFLECTION HOUSING DEFLECTION PISTON LOW FRICTION BEARING DEFLECTION —— HOUSING CAP -142 164 -148 FIG.8149 LOW FRICTION BEARING MUD PASSAGE LINE FLEX SHAFT-SEAL 142-SKIN

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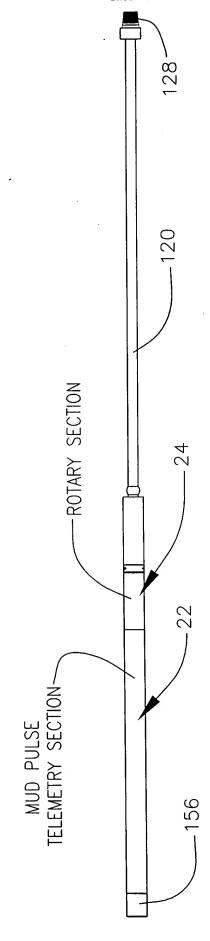


FIG. 11

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Title: THREE-DIMENSIONAL STEERING TOOL
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Sheet 11 of 15 28. FLEX SHAFT -152 BEARING PACK -120 -DRIVE SHAFT 160 FIG. 13 FIG. 12 500 24\ 156 154 TOOL JOINT COUPLING 52.

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FOR CONTROLLED DOWNHOLE EXTENDEDREACH DIRECTIONAL DRILLING
Sheet 12 of 15 154 ROÌARY SECTION VALVE 186 > VALVE HOUSING SEAL -40 184 56-MOTOR CARTRIDGE ASSEMLBY -173 175~ 98 -166 -166 ROTARY SECTION --VALVE MOTOR 162 -164 120 152~ ELECTRICAL WIRES-MUD PULSE TELEMETRY HOUSING POWER SUPPLY-DRIVE SHAFT

DRIVE SHAFT

FIG. 14

FLEX SECTION VALVE MOTOR

ELECTRICAL WIRES

3D STEERING TOOL — CONTROL ELECTRONICS

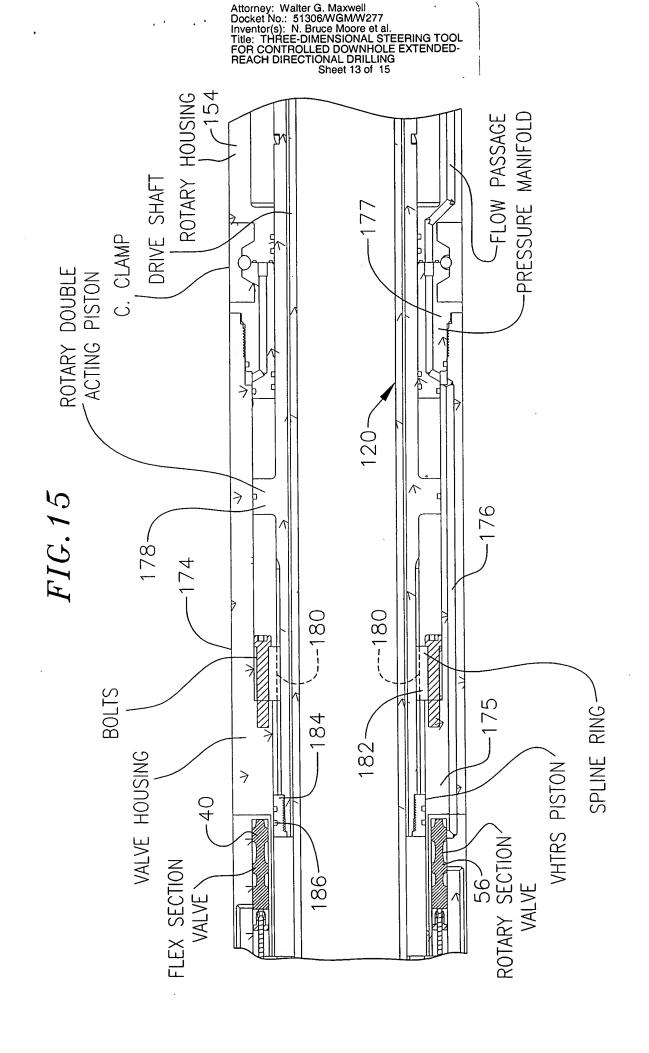


FIG. 16

